



# Agam

DEPARTMENT OF THE ARMY  
US ARMY DEFENSE AMMUNITION CENTER AND SCHOOL  
SAVANNA, ILLINOIS 61074-9639

REPLY TO  
ATTENTION OF:

SMCAC-ESL (385[A])

**13 SEP 1990**

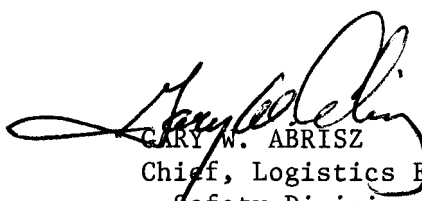
MEMORANDUM FOR Chairman, Department of Defense Explosives Safety Board,  
ATTN: DDESB-KT, 2461 Eisenhower Avenue, Alexandria, VA  
22331-0600

SUBJECT: Revised Technical Data Package (TDP) for the Agam Steel Panel (ASP)  
Walling System

1. Reference memorandum, U.S. Army Defense Ammunition Center and School (USADACS), SMCAC-ESL, 12 July 1990, subject: Agam Steel Panel (ASP) Walling System.
2. A revised TDP for the ASP walling system (enclosure) is forwarded for your review. No change to the technical data was noted. The corporation that held the patents on the ASP walling system has sold out or been taken over by another corporation. The changes to the TDP entail changing one corporation name for another and some minor wording regarding who has the legal rights to sell the ASP walling system.
3. The revised TDP does not change any of the hard data. Therefore, the U.S. Army Technical Center for Explosives Safety (USATCES) recommends that the approval be IAW referenced memorandum.
4. Point of contact (POC) is Mr. Greg Heles, SMCAC-ESL, DSN 585-8877.

FOR THE DIRECTOR:

Encl  
as

  
GARY W. ABRISZ  
Chief, Logistics Explosives  
Safety Division

CF (wo/encl):

Office of the Chief of Staff, U.S. Army, ATTN: DACS-SF, Washington, DC  
20310-0200

Commander, U.S. Army Safety Center, ATTN: CSSC-PR, Fort Rucker, AL  
36362-5363

Commander, U.S. Army Armament, Munitions and Chemical Command,  
ATTN: AMCPM-AL, Picatinny Arsenal, NJ 07806-5000

# AMMUNITION QUICKLOAD PROGRAM

Barriers for Truck Protection

6 August 90

JERRY L. WATSON  
PHILIP J. PEREGINO  
US Army Ballistic Research Laboratory  
Aberdeen Proving Ground, MD

Revised TDP

## ACKNOWLEDGEMENTS

This work was sponsored by the Project Manager for Ammunition Logistics and tests were performed at Socorro, New Mexico by the TERA Group of the New Mexico Institute of Mining and Technology. The Agan Steel Panel (ASP) Barrier concept being tested was engineered by Mr. Yaakov Yerushalmi and was suggested as a means of protecting ammunition stores by MG. James A Johnson, ret'd.

## I. INTRODUCTION

The purpose of this report is to provide a means of storing truck loads of ammunition in close proximity to each other so that a detonative reaction on one truck would not propagate to another. By containing the reaction to a single truck event the overall violence is reduced and a smaller Q-D achieved for the storage site.

## II. BACKGROUND

Reference is made to DOD 6055.9 STD, DOD Ammunition and Explosives Safety Standards (1) and AR 385-64, Ammunition and Explosives Safety Standards (2), which implements the Department of Defense Standards. These references give the quantity-distance (Q-D) criteria for the storage and handling of all conventional ammunition. This criteria is designed to provide the appropriate level of protection necessary against blast and fragment hazards. Explosives safety distance tables describe necessary separations and specify maximum quantities of the various classes of explosives permitted in any one location. These tables reflect acceptable minimum criteria for storage and handling of explosives. Such criteria provide reasonable safety with specified limits compatible with the risks of an accidental explosion. Both the DOD 6055.9-STD and the AR which implements this standard for Army installations and activities provide the opportunity for reduced hazard distances corresponding to reduced fragment and blast hazards, if it can indeed be demonstrated that the hazards are reduced. The burden of proof is upon the initiating activity to demonstrate an acceptable level of safety, however.

## III. RATIONALE

To fulfill their missions, units may be required to store basic load ammunition upon trucks. The required separation distances for these trucks is determined by Chapter 10 (1,2) which provides quantity-distance (Q-D) criteria for the storage of conventional ammunition in Basic Load Ammunition Holding Areas (BLAHA). The design of this storage barrier was predicated upon the fact that it could prevent the detonation of neighboring trucks loaded with ammunition by stopping the fragments and deflection the blast at distances closer than that which is required by the regulations. The barrier specified here has been shown by experiments to limit the reaction to a single truckload of ammunition at a much closer separation distance.

#### IV. BARRIER DESCRIPTION

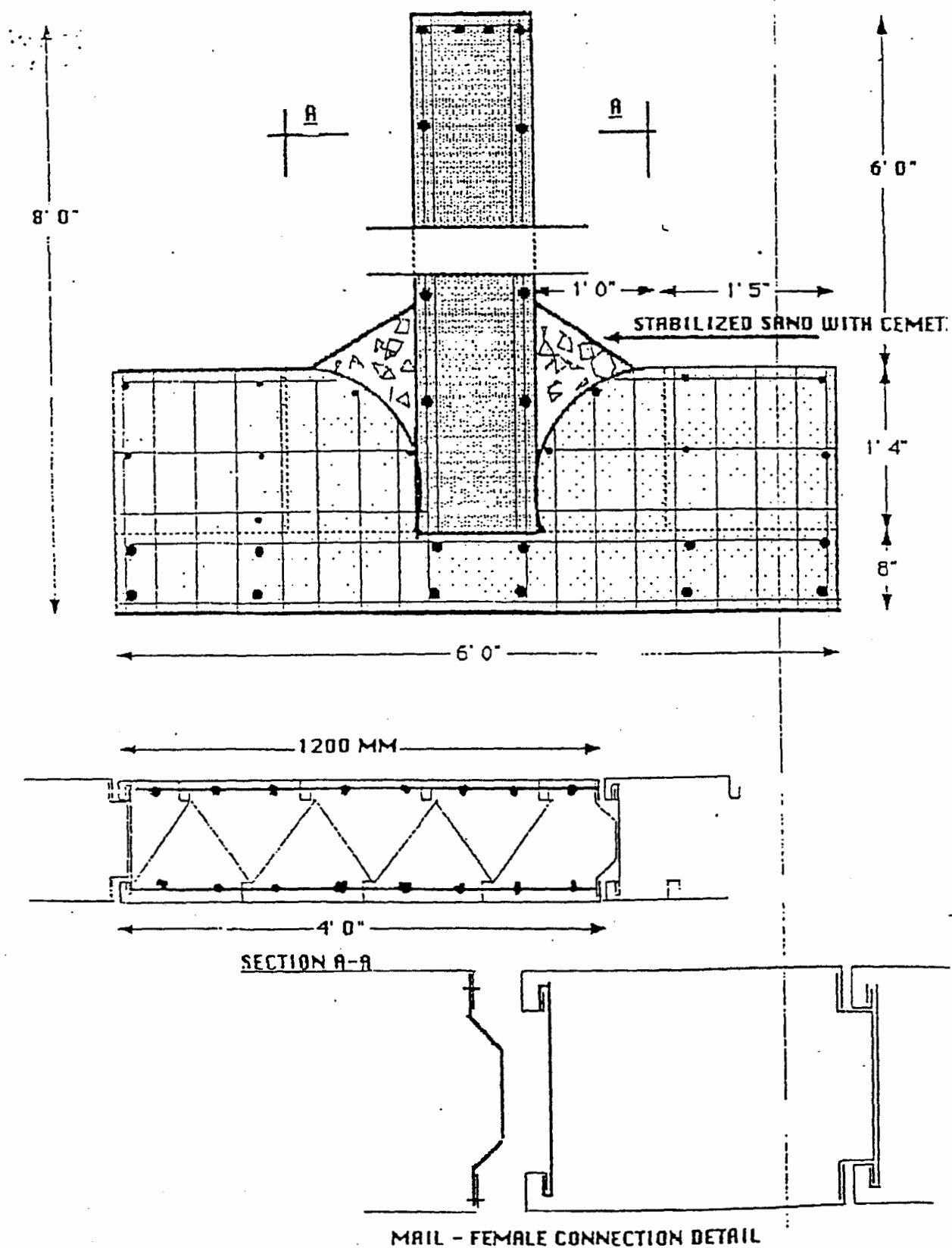
The barrier specified here to separate the trucks of ammunition is constructed using the Agan Steel Panel (ASP) concept and is shown in figure 1. The barrier is built in 4 foot segments and assembled into a wall of any desired length. Details of the wall and its construction are shown in the inclosure. Figure 2 shows the ASP barrier in a typical application being used between two trucks loaded with munitions.

#### V. USE OF THE BARRIER

The above specified barrier may be used to separate truckloads of ammunition which have an NEW of 2500 lbs or less with a minimum separation distance of 15 ft (4.5 m). The barrier must be large enough so that none of the ammunition on one truck is in direct line of sight of the ammunition on the other trucks. For a BLAHA with trucks shielded in this manner the Q-D requirements for public traffic routes is 600 ft and the inhabited building distance is 900 ft regardless of the number of trucks.

1. DOD 6055.9-STD, DOD Ammunition and Explosive Safety Standards.
2. AR 385-64, Ammunition and Explosive Safety Standards.

New Page



**TAFI** - TRADE AND FINANCE ESTABLISHMENT 5.1.90

Figure 1. A.S.P. Barrier Wall Detail

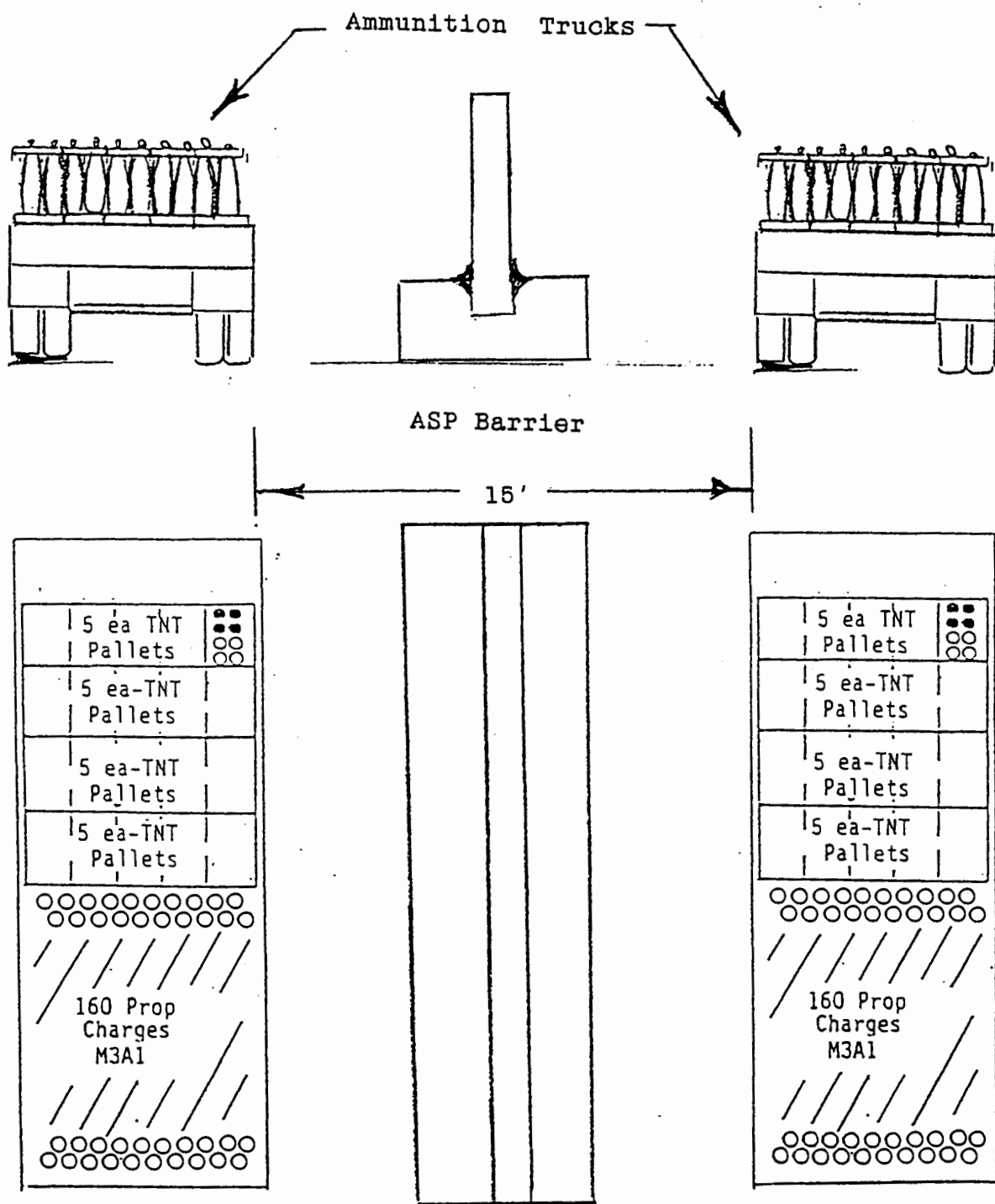


Figure 2. Typical Application of ASP Barrier Wall

K<sub>J</sub> INC.

Tel. (703) 250-5636

JAMES A. JOHNSON, P.E.  
Consultant

11000 Henderson Rd.  
Fairfax Station, VA 22039

## THE A.S.P. WALLING SYSTEM



**THE A.S.P. WALLING SYSTEM**  
**SPECIAL SPECIFICATIONS**

## 1. GENERAL

- 1.1 ASP GENERAL SPECIFICATIONS - general specification and recommendations for the erection of the ASP system is in Appendix "A" to this document.
- 1.2 The special specification describes briefly some of the main points of the general specifications and the additions required for the special testing panels.
- 1.3 The contractor have to learn the general specifications as well as the special specifications.
- 1.4 The construction will not start before the designer or it's representative will visit the site.

## 2. DELIVERY OF STEEL PANELS TO THE TESTING SITE.

- 2.1 The ASP panels for this test were delivered to the site , following is a check list for each (one) wall unit.

(a) 7 external panels 7' 4" long ,300 mm wide , one special panel with a cut on one rib for the male female connections between wall units.

(b) 2 external panels 7' 4" long, 150 mm wide, one of them with a cut on the rib

(c) One end-male element 7' 4" long.

(d) One end-female element 7' 4" long.

(d) 7 diagonal panels.

- 2.2 The external panels were designed with holes in the ribs to allow 1/2" tranversed reinforcement, the contractor should check in advance that this holes are alligned and tranversed reiforcement can be slided along,through this holes.

- 2.3 The panels should be stored in accordance with the general specifications..

TESTING OF ASP PANELS - C.O.E - NEW MEXICO - SPECIAL SPECIFICATION

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## 3 PREPARING THE FOUNDATIONS

- 3.1 The foundation for each element can be constructed at the construction site and not at the testing site.
- 3.2 The foundation dimensions is 1200 mm long, 6'0" wide and 2'0" high, the foundations are without male-female connections.
- 3.3 Concrete for the foundation is 4500 psi.
- 3.4 High tensile standard reinforcement rebars will be used.
- 3.5 Starter-rebars to tie the wall panels to the foundations are 3/4" diameter each 150 mm. Two lifting hooks will be welded to the starter bars. ( 1" diameter and embeded 6' inside the wall).

## 4. ERECTING THE ASP WALL ON THE FOUNDATION.

- 4.1 Panels erection will not start before the visit of the designer or it's representative.
- 4.2 Panels will be constructed on the foundations in accordance with the general specifications and under the supervision of the designer or it's representative.
- 4.3 The contractor will check that all the ASP panels are tied and secured especially the end male - female panels.
- 4.4 The male - female panels will be supported in the vertical direction before concreting of the wall.
- 4.5 The designer or it's representative will check the panel erection and the supports before concreting of the wall.
- 4.6 6" slump concrete will be used for the wall poured in layers in accordance with the general specifications. The height of each layer will not exceed 2'. No vibration is required.

## 5 STABILIZED SAND WITH CEMENT

The stabilized cement will consist of wet mixture of sand and 15%

portland cement.

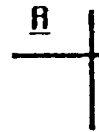
6. TRANSPORTATION TO THE TESTING SITE

The wall elements can be transported to the testing site 28 days after concreting of the wall

NOTE

REBARS ARE 1/2" UNLESS

3/4" ARE SPECIFIED



6' 0"

0"

3/4" each 15 cm

1' 0"

1' 5"

1' 4"

8"

3/4"

3/4"

6' 0"

1200 MM

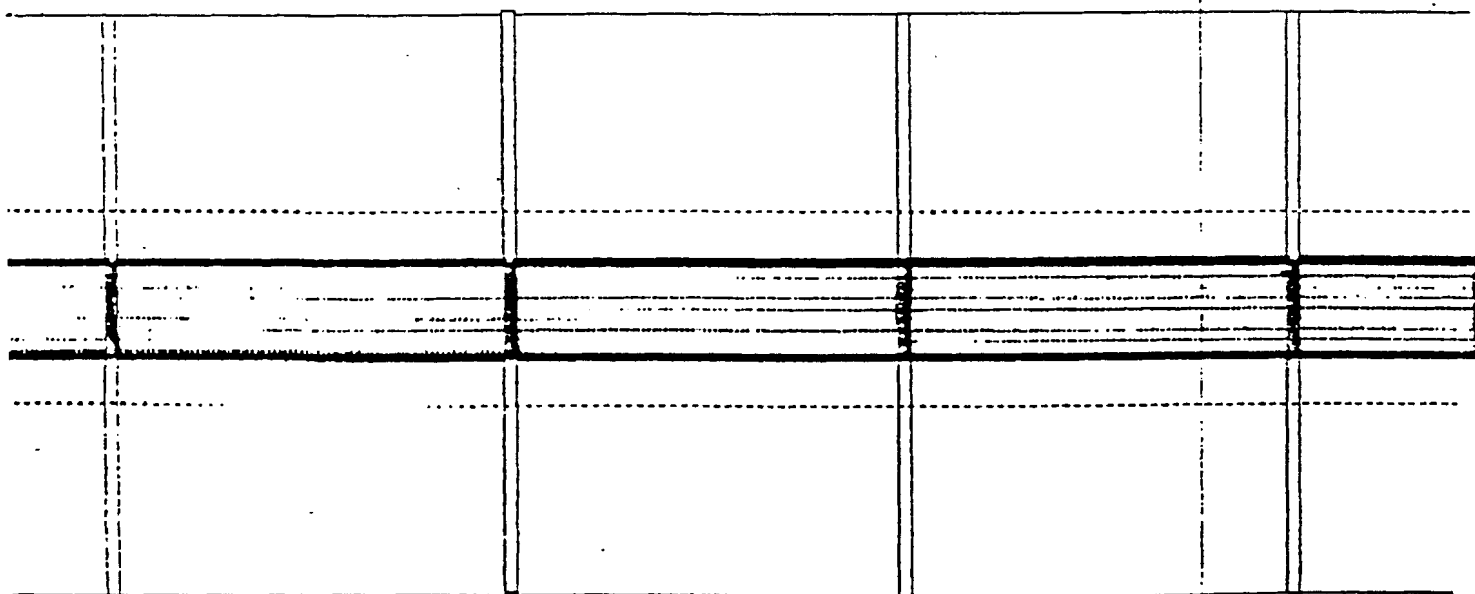
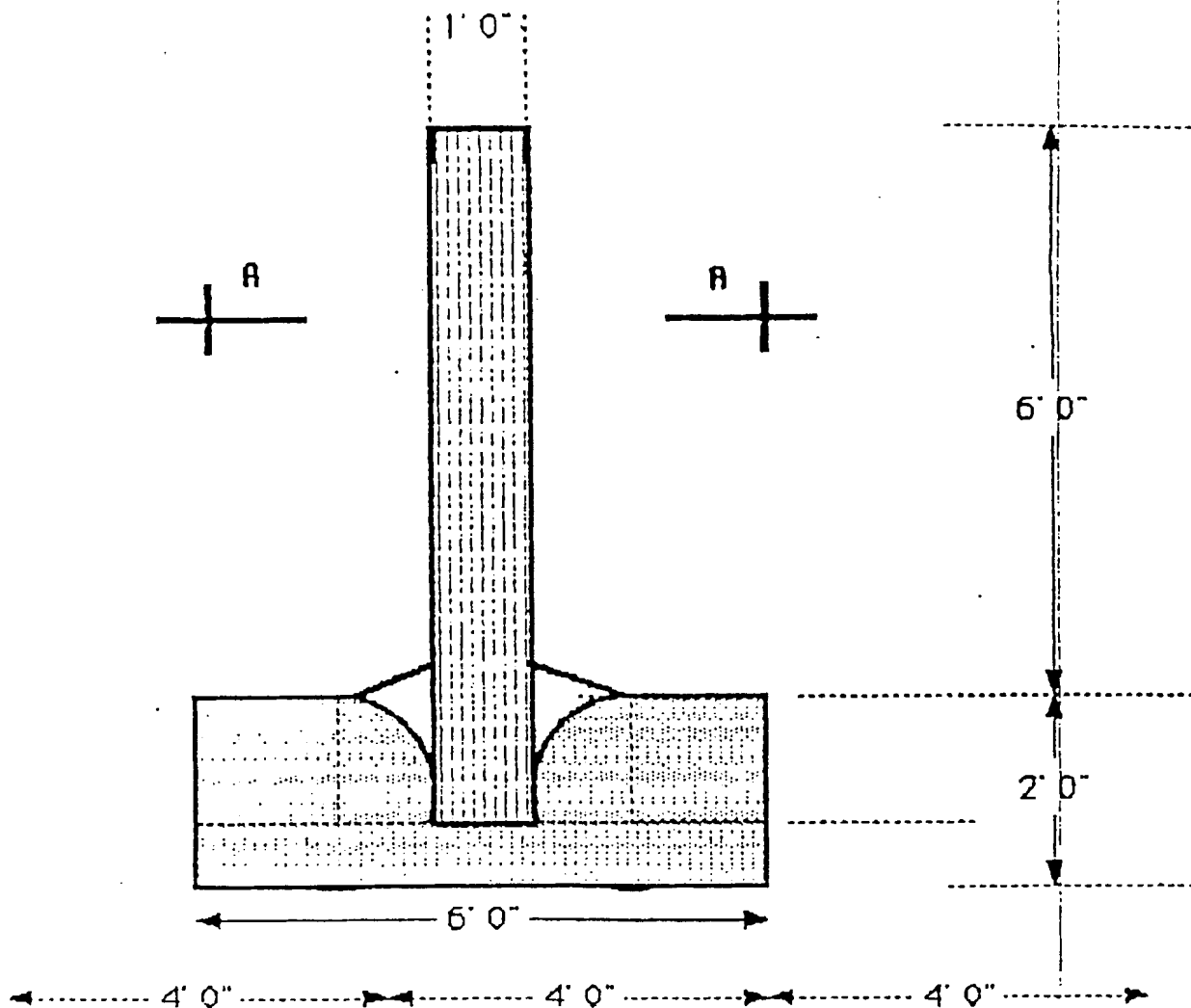
4' 0"

SECTION A-A

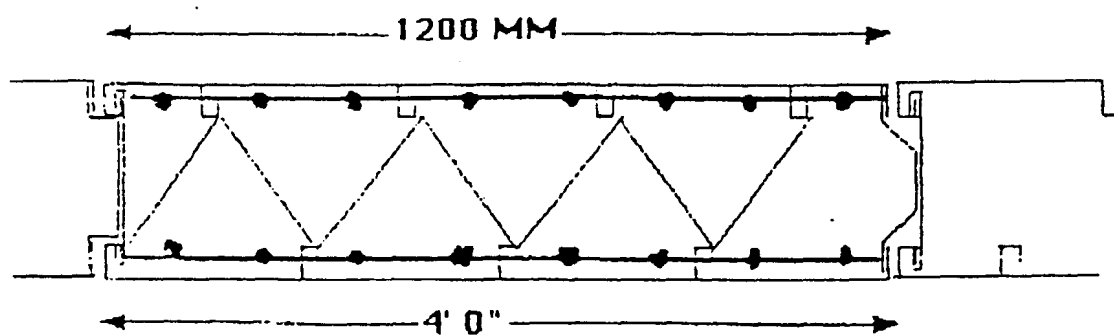
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MAIL - FEMALE CONNECTION DETAIL



SECTION A-A



MAIL - FEMALE CONNECTION DETAIL

**THE A.S.P. WALLING SYSTEM**

**GENERAL SPECIFICATIONS**



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## 1. INTRODUCTION

### 1.1 Description

The patented ASP/EXP system comprises two major components that are blast and fragment resistant namely:

- (a) The ASP Walling which is an aesthetically pleasing composite construction of steel and concrete that provides protection against the effects of explosives and various weapons in a more efficient manner than the reinforced concrete alternatives, and
- (b) The EXP Doors which are used with or without the ASP Walling and can be designed to offer any required level of protection.

### 1.2 Effectiveness

The ASP Walling is especially effective in providing protection against blast and fragments.

The ASP Walling can be up to one third but is generally half as thick as a reinforced concrete wall designed for the same level of protection.

### 1.3 Cost

The cost of the ASP Walling ranges from 50% to 70% of the cost of the reinforced concrete counterparts.

### 1.4 Design

The specialist design for each application is provided as an integral part of the system.

### 1.5 Tests

The ASP system has been tested extensively and successfully against a large variety of weapons and explosives.

## 2. THE ASP WALLING SYSTEM

### 2.1 General Description

The ASP Walling system consists of formed metal sheets joined together to constitute both the permanent formwork and the reinforcement to the concrete, while at the same time acting as anti-spalling plates to contain fragments.

The basic component of the ASP walling system is a wall element (Fig. 1) consisting of interlocked external sheets. The two faces are tied to each other by diagonal lacing panels which, in zig-zag fashion, form a rigid permanent formwork into which concrete is placed (see photographs no. 1 and 2 in Appendix B).

The ASP sheets provide the necessary reinforcement to the concrete. The external sheets are the tensile and compressive reinforcement while the diagonal lacing panels are the shear reinforcement. No additional reinforcement is needed except for reinforcing bars at top and bottom as a connection to the concrete roof and foundation.

The sheets are rolled in three modules : for 8" , 10" or 12" thick walls (nominal). Half module sheets are also standard. The standard sheet profiles are shown in Figs. 2 and 3.

Structures should be dimensioned to suit the half or full module of the required ASP walling to provide the most cost effective solution, though non standard dimensions can be accommodated.

The ASP Walling system produces a strong, ductile and fragment resistant component for the construction of protective walls and hardened buildings.

It is a versatile, easy-to-erect and cost-effective construction system.

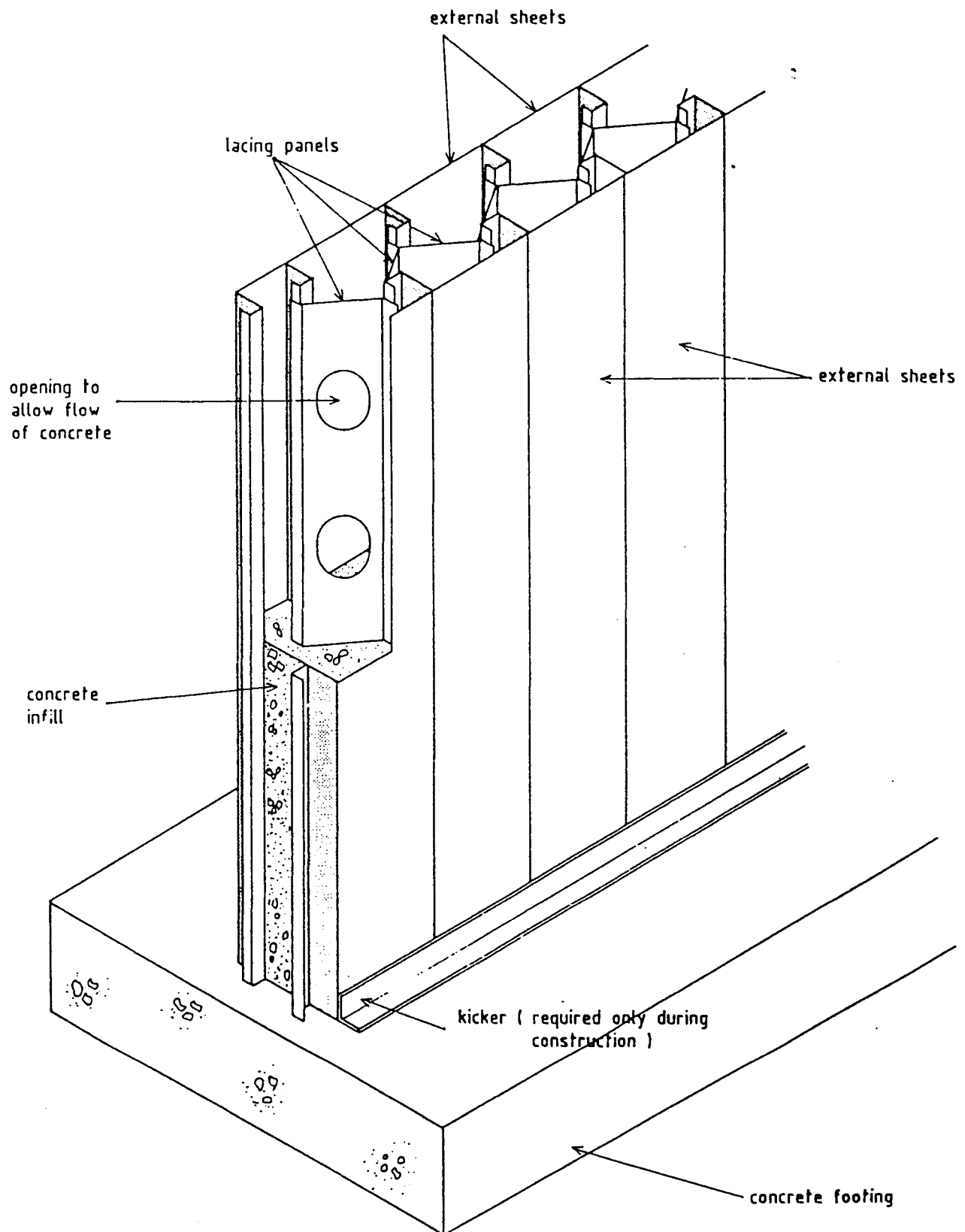


Fig. 1

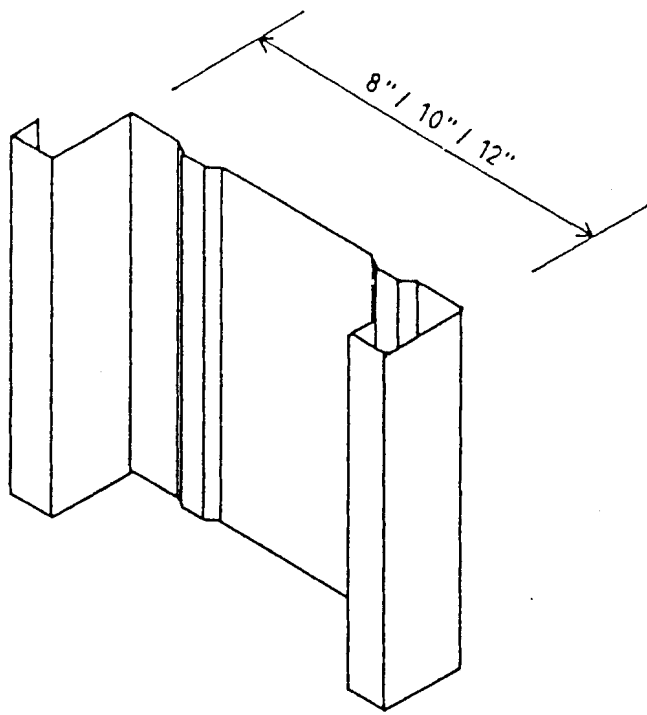


Fig. 2  
ASP External Sheet  
(viewed from inside)

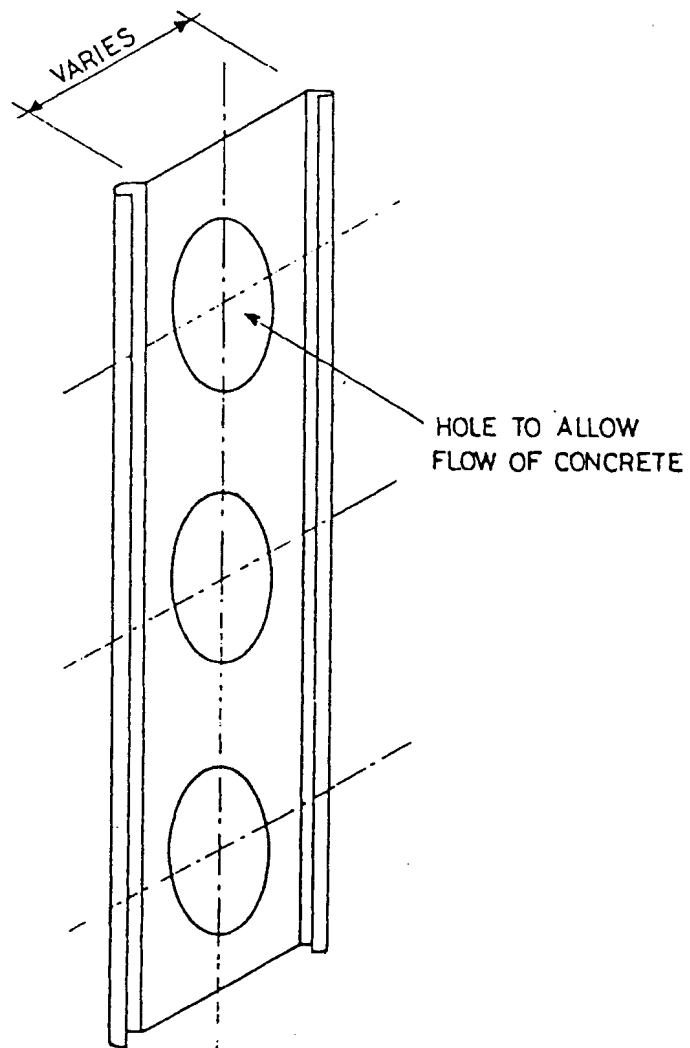


Fig. 3

## 2.2 Reinforcement to the ASP wall

The external steel sheets form the main reinforcement to the concrete. They provide the section with symmetrical tensile and compressive reinforcement. The steel ribs are deeply embedded in the concrete ensuring a good bond between the concrete and reinforcement.

The diagonal lacing panels not only form a lattice-work effectively securing the external faces to each other, but also act as uniformly distributed shear reinforcement.

No additional reinforcement, in the form of reinforcing bars, is required in the walls except for the starter bars from the foundation into wall (Fig. 4), corner bars at the connection between a wall and roof slab (Fig. 5) and straight bars at horizontal joints in the external ASP sheets (Fig. 6).

## 2.3 Fabrication of ASP walling material

The patent owners design team will determine the required sheeting arrangement for a structure, taking the Contractor's program into account.

The ASP sheets are rolled, generally using a Z275 galvanised commercial grade steel coil material, cut to the lengths detailed by the design team. Other materials such as stainless steel or coated steel can be provided for specialized applications.

## 2.4 Construction

After conventional concrete foundations are cast with reinforcing starter bars to project and tie into the walls (see photograph 3 in Appendix B) a scaffold is erected to provide the nominal support required to keep the wall upright. The ASP sheets are then erected and aligned against both a kicker angle secured to the foundation and the scaffolding support.

Because it is a modular system, layout arrangements are easily achieved. Because it is a standardised system the metal ASP sheets are easily and rapidly erected. The system does not require specialist labour and is thus easily handled by most general Contractors.

Due to this and the fact that the steel ASP sheets provide all the necessary reinforcement, the erection time for the ASP Walling can be up to 5 times faster than reinforced concrete systems.

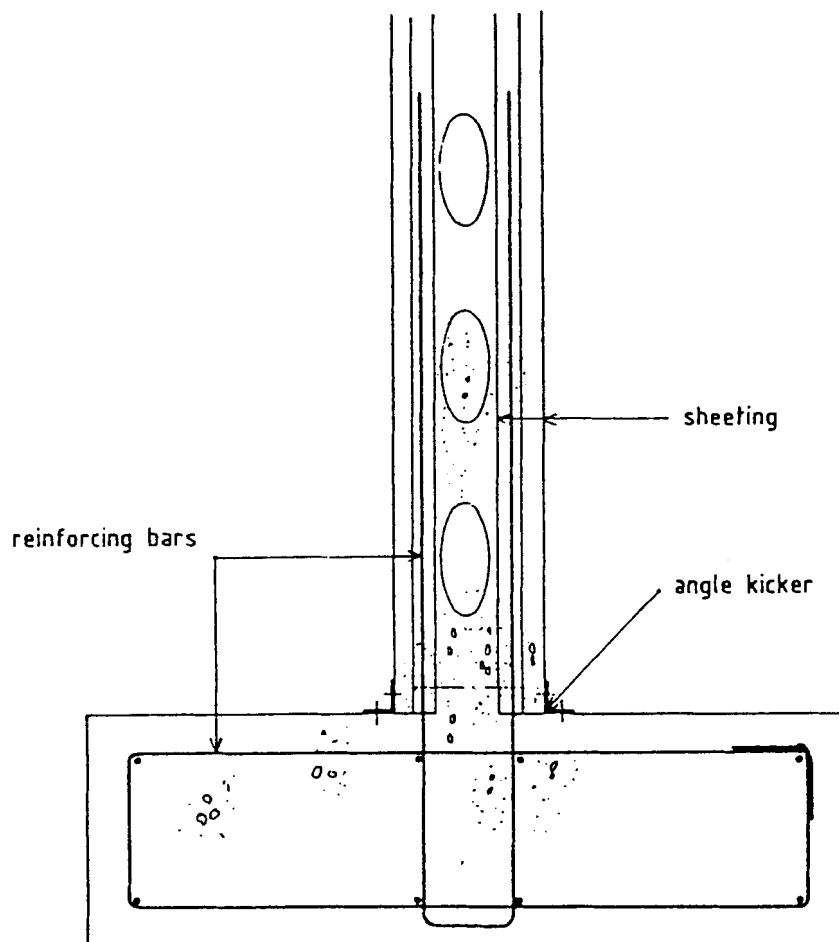
The external sheets easily interlock with each other at their shaped ribs in male-female fashion (Fig. 7). The sheets in the external faces are staggered so that the ribs may receive the lacing panels. These lacing panels are slid from the top and secured, as can be seen in photograph 4 in Appendix B.

However, a method of erection from the side has been developed enabling the ASP walling to be used in an existing structure where the normal construction procedure of erection from the top cannot be adopted (see photograph 5, 6 and 7 in Appendix B).

The assembled ASP sheets form a rigid permanent form-work into which the high slump concrete is placed. Pouring of the concrete must be gradual but is done very easily if the concrete mix is of the correct slump. The diagonal lacing panels are perforated with circular holes to allow the flow of the concrete through them (see Figs. 1 and 3).

Complete wall sections, and even small structures, can be erected and concreted on off-site production lines, and then be transported to their final position.

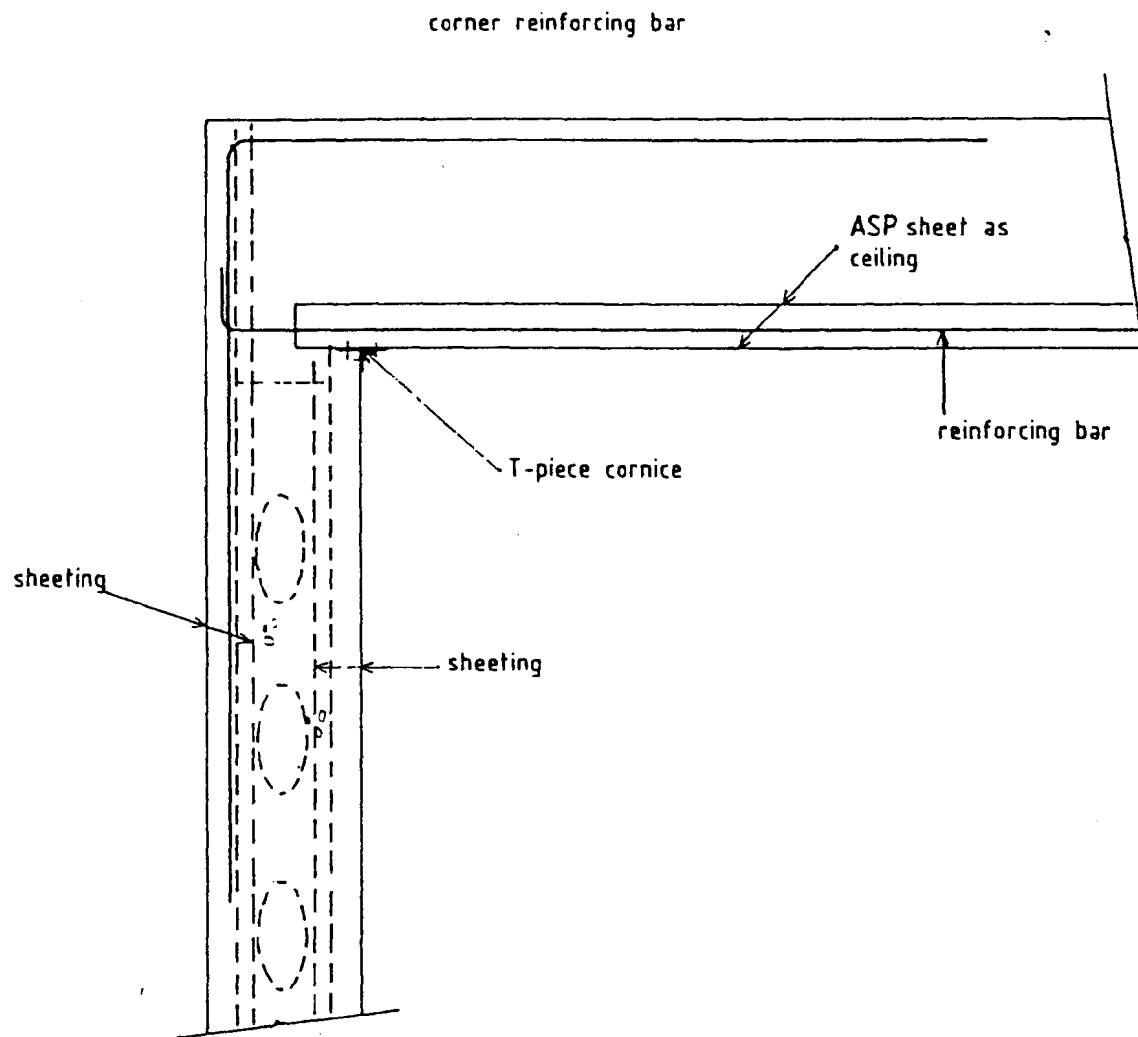
A comprehensive brochure entitled "Specifications and Erection Guidelines for ASP walling" is available and gives detailed technical requirements as well as guidelines for the construction of the ASP system. If required a demonstration in the construction procedure can be given to Contractors.



TYPICAL WALL-FOOTING CONNECTION

Fig. 4





TYPICAL WALL-SLAB CONNECTION

Fig. 5

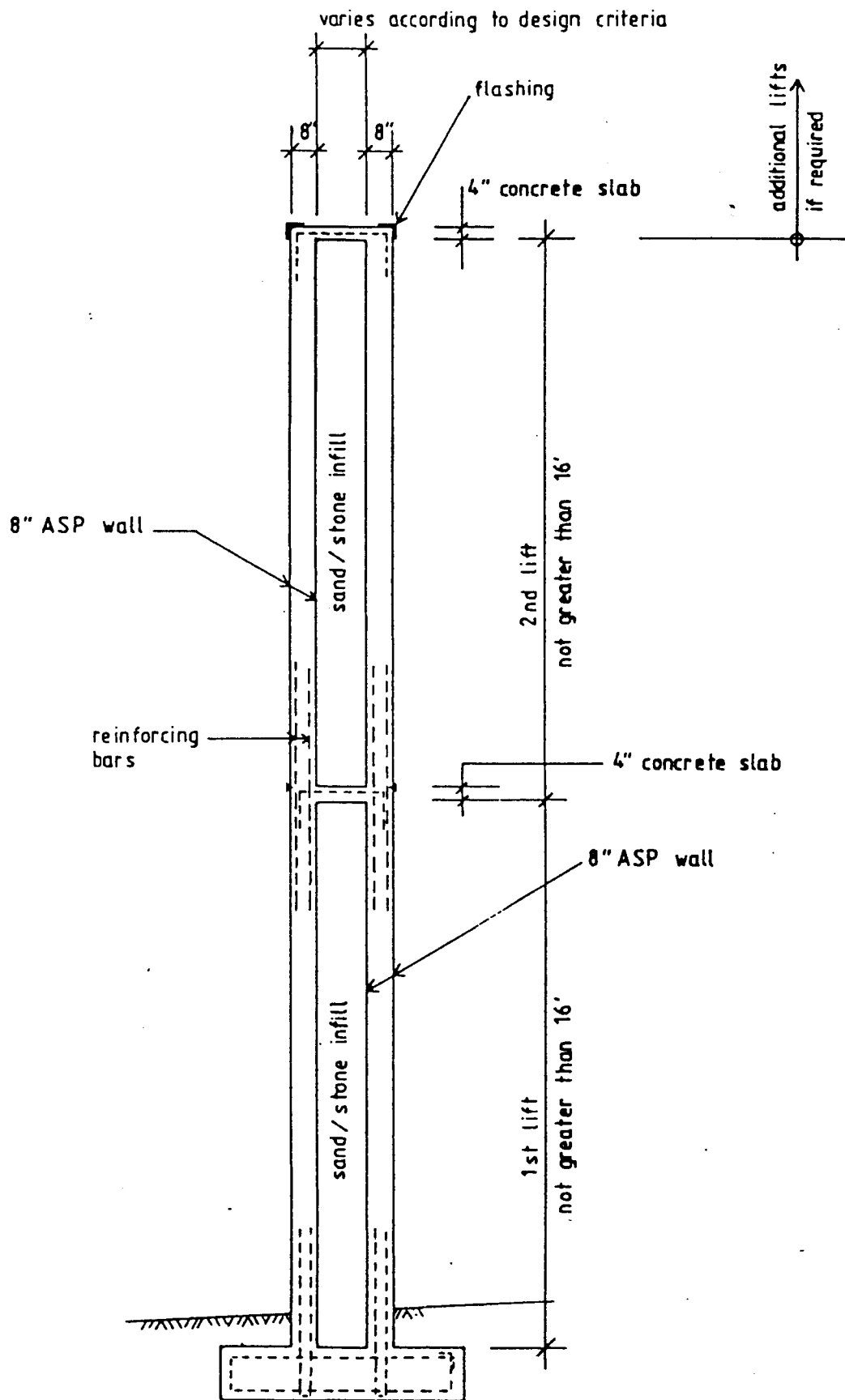
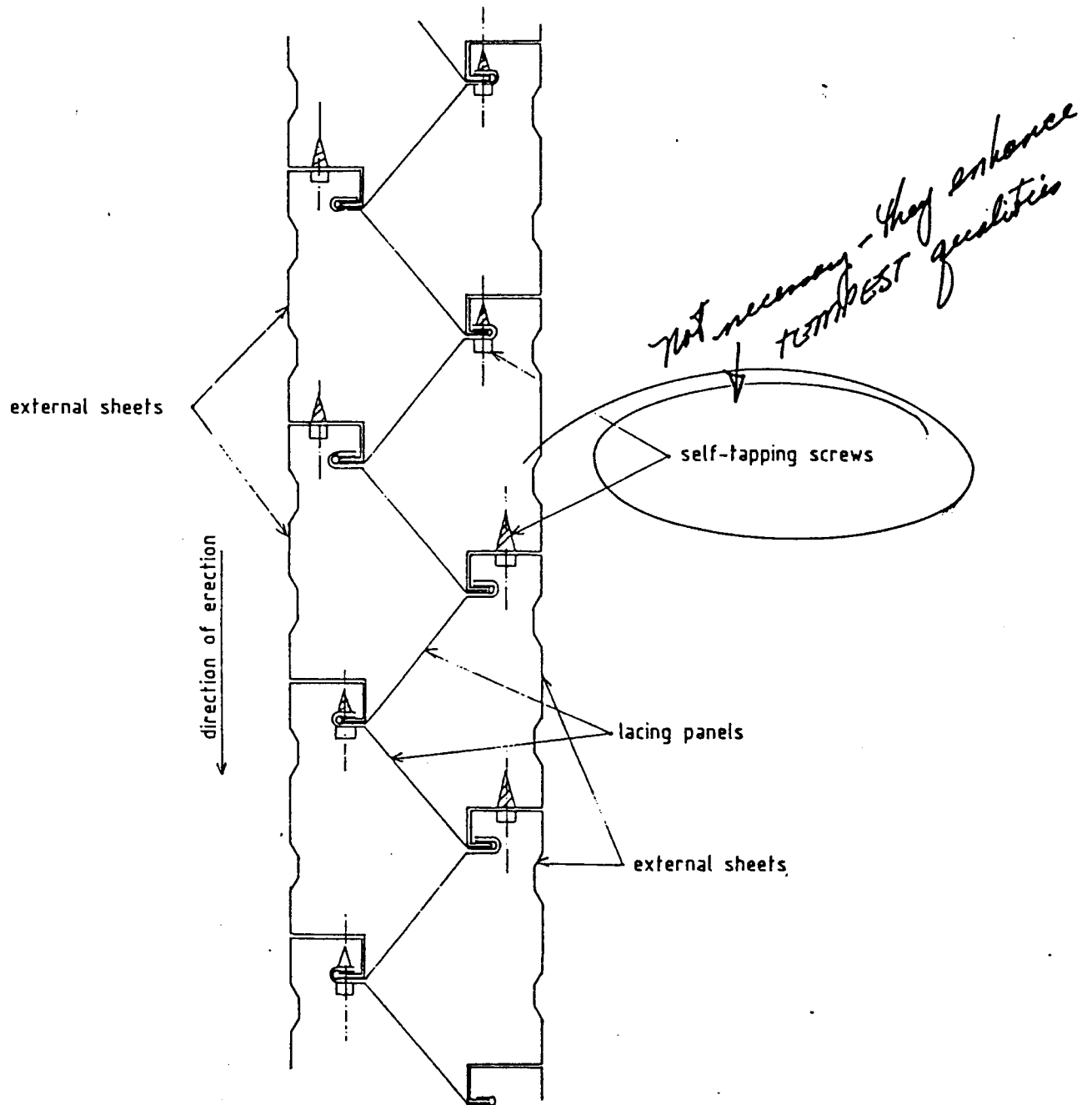


Fig. 6

A Typical High ASP Wall



DETAIL OF SHEET ASSEMBLY : PLAN VIEW

Fig. 7

## 2.5 Effectiveness

As a guide, the ASP wall will generally be half as thick as a conventional reinforced concrete wall designed for the same level of protection against blast and fragments, although in certain instances a 10" ASP wall has proved to be equivalent to 2'-0" of reinforced concrete.

The reduced thickness of the ASP wall provides a distinct weight advantage over its reinforced concrete counterparts which enables e.g. transportable sections to become effective. In existing buildings it may also become feasible to construct protective ASP walls where the heavier, reinforced concrete counterparts would overstress the existing structure.

The ASP wall has an additional advantage over a reinforced concrete wall as it offers natural anti-spalling plates to contain concrete fragments, which are often a major danger in protective structures.

Another major advantage over conventional reinforced concrete is the fact that cracks do not propagate in the system, and damage under attack is thus very localised. After an attack the structural integrity of the ASP wall is therefore not compromised to the same extent as with reinforced concrete. It is also easier to carry out repairs since the damaged area is smaller in extent.

The system is suited to upgrading and this aspect can be taken into account in the design. This allows the implementation of the desired protection in phases, as well as allowing for the upgrading to take into account possible higher weapons criteria in the future.

## 2.6 Cost

The ASP wall has been proved to be cheaper than a conventional reinforced concrete structure for the same level of protection. The cost increase for the permanent formwork is more than offset by the savings in labour, concrete and reinforcement.

As a guideline, it has been found that the ASP system costs between 50% and 70% of the cost for a comparable reinforced concrete protective system.

## 2.7 Doors and Services

EXP doors specially designed to meet the same weapon criteria as the ASP walling are part of the system, and are built in as a complete unit which is made to order. Other services can be readily accommodated in the system in a manner which provides the same level of protection.

## 2.8 Corrosion

Anti-corrosion precautions are always taken into account to provide the necessary resistance to corrosion for individual sites. The galvanised ASP sheets automatically give a degree of galvanic protection.

Corrosion protection options available include the use of:

- precoated galvanised coil material
- stainless steel coil material
- various external protective coatings
- joint sealants

## 2.9 Aesthetics

Protective structures are usually functional and of a very austere nature.

The slight flutes in the ASP external sheets together with the vertical lines at joints between ASP sheets diminish this austere character. In addition, the use of coloured coatings results in some very attractive structures as can be seen in photographs 8 to 10 in Appendix 'B'.

# **TAFI** - TRADE AND FINANCE ESTABLISHMENT

5 REULESTRASSE P.O.B 83 FL 9490 VADUZ

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USA ARMY  
ARMAMENT RESEARCH AND DEVELOPMENT COMMAND  
BALLISTIC RESEARCH LABORATORIES  
ABERDEEN PROVING GROUND  
MD-21005

26/3/1990  
REF-TAF38

ATTN : MR J.WATSON AND MR P.PEREGINO

DEAR SIRS ;

## **RE : Ammunition Quickload Program, ASP Barriers for Truck Protection.**

This letter serves to introduce our organization who has recently purchased from KOOR METALS LTD (KML) and its' subsidiary KYK the patent rights and its' respective technical data for the Blast and Fragment Resistant Protective wall Structure and Building Structure known as the ASP system. The ASP system is covered under US patent No : 4433,522 granted Feb 28 , 1984.

Mr Y.Yerushalmi the inventor of the ASP system has also merged into our organization.

The US Army has completed a series of tests and evaluation of the ASP system, as stated in your report dated the 10<sup>th</sup> of August 89.

In this connection and for avoidance of doubt we wish to request you to effect the following corrections in the final report , all of which are lined in the enclosed copy with a yellow Hi-liter.

### **1. CHAPTER - IV BARRIER DESCRIPTION**

✓ Delete " The wall can be purchased from the manufacturer"

---

TECHNICAL AGENTS **Y . Y . LTD**

3 HAPARTIZANIM ST'  
PETACH - TIQVA  
49551 - ISRAEL

TEL : 972-3-344235  
FAX : 972-3-349935  
TLY : 361201

## 2. CHAPTER - V USE OF THE BARRIER

✓ Delete " The barrier must be built in accordance with the manufacturers recommendations"

Both remarks must be deleted since none of the wall manufacturers is licensed to sell the product ,nor is he authorized to provide recommendations for Blast and Fragment Resistant Walls.

You are therefore kindly requested to insert where appropriate :

"All inquiries for the adoption of the ASP system should be addressed to the owners of the patent".

## 3. For the same reasons stated above you are requested to ammend in :

## PARAGRAPH 2.3 - FABRICATION OF THE ASP WALLING MATERIAL

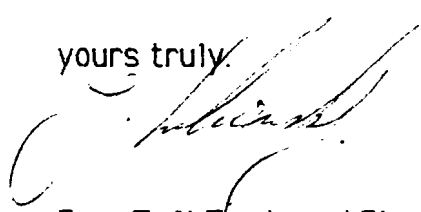
✓ Delete : " The IMT design team"

Insert " The patent owners design team"

## 4. You are further requested to replace the title block on Drawings and Figs with our trade mark TAFI and date as appropriate.

We thank you for your assistance and cooperation and remain,

yours truly,



For : Tafi Trade and Finance Est.

#### IV. BARRIER DESCRIPTION

The barrier specified here to separate the trucks of ammunition is constructed using the Agan Steel Panel (ASP) concept and is shown in figure 1. The barrier is built in 4 foot segments and assembled into a wall of any desired length. Details of the wall and its construction are shown in the inclosure. The wall can be purchased from the manufacturer and assembled into the barrier at the storage site. Figure 2. shows the ASP barrier in a typical application being used between two trucks loaded with munitions.

#### V. USE OF THE BARRIER

The above specified barrier may be used to separate truckloads of ammunition which have an NEW of 2500 lbs or less with a minimum separation distance of 15 ft (4.5 m). The barrier must be built in accordance with the manufacturers recommendations and must be large enough so that none of the ammunition on one truck is in direct line of sight of the ammunition on the other trucks. For a BLAHA with trucks shielded in this manner the Q-D requirements for public traffic routes is 600 ft and the inhabited building distance is 900 ft regardless of the number of trucks.

1. DOD 6055.9-STD, DOD Ammunition and Explosives Safety Standards.
2. AR 385-64, Ammunition and Explosive Safety Standards.

INSERT

ALL INQUIRIES FOR THE ADOPTION OF THE  
ASP SYSTEM SHOULD BE ADDRESSED TO THE  
OWNERS OF THE PATENT.



## 2.2 Reinforcement to the ASP wall

The external steel sheets form the main reinforcement to the concrete. They provide the section with symmetrical tensile and compressive reinforcement. The steel ribs are deeply embedded in the concrete ensuring a good bond between the concrete and reinforcement.

The diagonal lacing panels not only form a lattice-work effectively securing the external faces to each other, but also act as uniformly distributed shear reinforcement.

No additional reinforcement, in the form of reinforcing bars, is required in the walls except for the starter bars from the foundation into wall (Fig. 4), corner bars at the connection between a wall and roof slab (Fig. 5) and straight bars at horizontal joints in the external ASP sheets (Fig. 6).

## 2.3 Fabrication of ASP walling material

The IMT design team will determine the required sheeting arrangement for a structure, taking the Contractor's programme into account.

The ASP sheets are rolled, generally using a Z275 galvanised commercial grade steel coil material, cut to the lengths detailed by the design team. Other materials such as stainless steel or coated steel can be provided for specialized applications.

## 2.4 Construction

After conventional concrete foundations are cast with reinforcing starter bars to project and tie into the walls (see photograph 3 in Appendix B) a scaffold is erected to provide the nominal support required to keep the wall upright. The ASP sheets are then erected and aligned against both a kicker angle secured to the foundation and the scaffolding support.

**INSERT**

**THE PATENT'S OWNERS DESIGN TEAM**

11 May 1989

## MEMORANDUM FOR RECORD

SUBJECT: A.S.P. Walling System

This memorandum summarizes the results of tests conducted on an A.S.P. Walling System Concrete Barrier to be used to prevent propagation between truckloads of ammunition. This memorandum along with the two reports entitled "A.S.P. Walling System Concrete Barrier Test Results, Ammunition Quickload Series" and Ammunition Quickload Series, A.S.P. Walling System Test BDA0125A9 and Test BDA0213A9 Results" constitutes the technical data to support the TDP proposal being submitted to the DDESB for approval

Three full scale tests were performed at Socorro, New Mexico by New Mexico Institute of Mining and Technology, TERA Group. Reference is made to "A.S.P. Walling System Concrete Barrier Test Result Ammunition Quickload Series" report by NMT/TERA No. T-88-1718-U and to "Ammunition Quickload Test Series A.S.P. Walling System Test BDA0125A9 and Test BDA0213A9 Results" report by NMT/TERA No. T-89-1772-U.

Each test consisted of a donor trailer and an acceptor trailer. The trailers were placed 15 feet apart and were separated by five sections of an A.S.P. Walling System. The walls were 7.5 feet from each trailer, center to edge. The donor trailer consisted of four rows of five each M107 155mm TNT pallets, two feet from the front of the trailer. Behind the TNT pallets were 160 staggered M3A1 prop charge cans. Approximately eight feet at the rear of the trailer was left empty.

Two feet from the front of the acceptor trailer were two rows of three each Comp B pallets staggered with two rows of three each M483 pallets. Behind the pallets were 96 staggered M3A1 prop charge cans. Test BDA0213A9 consisted of 91 each M3A1 prop charge cans and five each M4A2 prop charge cans. On the outside of the acceptor trailer were four rows of 12 each sandbags four feet high.

The ground flush pressure gages were placed behind the trailers in line with the wall at 450, 550, and 650 feet. The test set-up can be seen in figures 1, 2 and three of either report and figure 4 of report No. T-89-1772-U.

## Results:

In all three tests four projectiles were detonated in the donor trailer. In each test the remaining ammunition on the donor trailer appeared to have detonated. Each of the donor trailers were completely destroyed with only portions of the wheels and axles remaining.

Test BDA0303A8

After detonation of the donor trailer all the Comp B and M483 acceptor projectiles were recovered with no evidence of reaction or detonation but some were damaged. Specific damage can be seen in Table I of report No. T-88-1718-U. All but three of the prop charge cans were recovered with severe crushing damage. Eight of the prop charges burned and it appeared to be due to the fragment impacts.

All five of the special concrete walls were destroyed and the bases were recovered ranging from 76 to 130 feet from the test site. Photographs of the set-up and results can be seen in the referenced report. The pressure traces can be seen in Appendix B of the same report.

Test BDA0125A9

Again all Comp B and M483 acceptor projectiles were recovered with no evidence of reaction or detonation, but with some damage. Seventy-eight prop charge cans were recovered and all were severely damaged. Specific damage can be seen in Table I of report No. T-89-1772-U. Fourteen of the prop charges burned again apparently due to the fragment impact. The remaining 18 prop charge cans appeared to have reacted violently but there was no evidence of detonation.

All of the concrete walls were destroyed and their bases were found at distances from 60 to 180 feet from the test site. Photographs of the test set-up and results can be seen in report No. T-89-1772-U and the pressure traces can be seen in Appendix B of the same report.

Test BDA0213A9

After detonation of the donor trailer all Comp B and M483 acceptor projectiles were recovered with no evidence of reaction or detonation, however they did sustain some damage. The specific damage is shown in Table II of report No. T-89-1772-U. Ninety-two prop charge cans were recovered, all of them severely damaged due to crushing and fragment impacts. Twelve of the acceptor charges burned with an additional three partially burned, again appearing to be initiated by impact from fragments. The remaining four prop charges appeared to have reacted violently but there was no evidence of detonation.

All of the concrete walls were destroyed and their bases were found from 70 to 120 feet from the test site. Photographs of the set-up and results can be seen in report No. T-89-1772-U and the pressure traces are in Appendix C of the same report.

Conclusion

Based upon the data collected the A.S.P. Walling system did prevent the mass detonation of the adjoining truckload of ammunition.

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